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FARM-POULTRY EDITION.

PROFITABLE POULTRY FARMING.

A TREATISE ON THE COMBINATION OF

EGGS, BROILERS, FRUITS, Etc.

WITH SPECIAL CHAPTERS ON

TESTING EGGS, AND DUCK CULTURE.

BY MICHAEL K. BOYER,

AUTHOR OF "ALL ABOUT BROILERS," AND "MONEY IN HENS;"

EDITOR FARM-POULTRY.

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Money
in Eggs

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ROUP,

SORE THROAT, CANKER,

SORE HEAD, Etc.

Leg Weakness, Rheumatism.

It is a fact, that very many of the diseases of human beings also attack our domestic animals, and *vice versa.* Sometimes in such cases they are known by the same name in both cases; while some other diseases of animals, which are the same or very similar to those affecting man, and brought on by the same causes, are popularly known by other names. Of this latter kind is that terrible disease **Roup,** which is more to be dreaded by poultry raisers than any disease that attacks poultry, except perhaps cholera,—chicken cholera as it is generally called.

Symptoms of Roup. Medical experts are unanimously of the opinion that diphtheria and croup in children, are identical with roup in poultry. At the same time the latter disease takes many forms of showing itself, but finally settles down into a distinct case of roup There are many poultry raisers who do not know the symptoms of roup, and who annually lose large numbers of fowls without being able to define the cause. Roup is thought by some to be more devastating than cholera, as it appears at all seasons. When the weather is damp, and the fowls exposed to storms (especially a north-easter), roup will put in an appearance suddenly. There are many forms of roup, but all come from colds. One of the principal causes of roup is the improper ventilation of the poultry house, which permits cold draughts of air to flow over the birds at night when they are on the roost.

Symptoms *are sneezing like a cold; watering of the eyes; running at the nostrils; severe inflammation in the throat; canker; swollen head, and eruptions on the head and face.*

Treatment. As often stated, the very best is prevention; but if the disease gets a foothold, remove **at once** the sick birds to a warm dry place, where there are no cracks in the walls to let in draughts, and above all, avoid top ventilation, which allows the cold air to blow down on the fowls. If the eyes, head and face are swollen, rub them with a few drops of a mixture of one *tablespoonful* of melted **vaseline,** and one *teaspoonful* of JOHNSON'S ANODYNE LINIMENT. Keep the two well mixed when cool by stirring. When their faces are not swollen, and the birds breathe hoarsely, it denotes that the effect is due to dampness; but when the birds are exposed to draughts, it happens also that the swelled heads and eyes may be accompanied by the hoarse breathing as well as by a discharge from the nostrils. If the disease has reached the malignant form it is contagious, and a very [illegible] odor will be noticed in the poultry house, and especially if the beak of the fowl is opened and examination made by the sense of smell.

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By M. K. BOYER.

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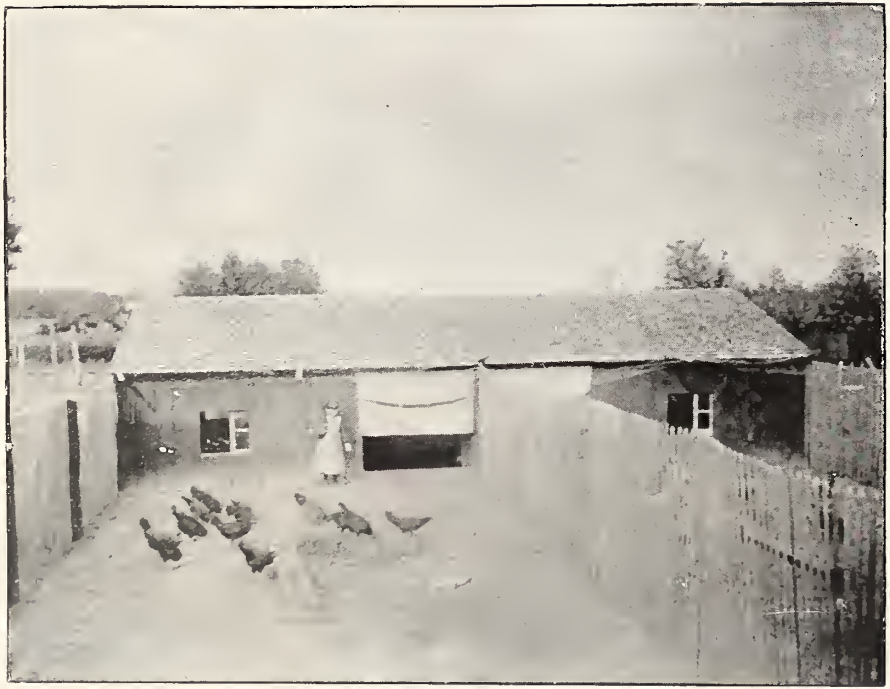

SCRATCHING SHEDS.—One of the Original Ideas.
From a Photograph of one of the Hen Houses on M. K. Boyer's New Jersey Farm

PROFITABLE

POULTRY FARMING

By MICHAEL K. BOYER,

Editor FARM-POULTRY,

Author of "All About Broilers and Market Poultry Generally,"

and "Money in Hens."

Price, 25 Cents.

(Second Edition.)

NATICK, MASS.
PUBLISHED AND FOR SALE BY THE AUTHOR.
1896.

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PREFACE.

It is customary, in writing a book, to have a preface, and that is my only excuse for giving one here. I have written this work for the purpose of assisting the novice who has taken on the "hen fever,' and would like practical advice with the enthusiasm left off. If I succeed in my mission I am satisfied. It is my intention to show how money can be made on SMALL FARMS, and the advantage of making poultry an adjunct to some other occupation. I give a number of experiences and plans, and let the reader do the selecting. To more properly conduct the work, I have visited large duck farms on Long Island, and prominent poultry establishments in different parts of the country; so that the instructions as given in the book are those from my own personal experience, coupled with what I have seen in my rounds.

The advertising pages have been carefully edited, and I feel proud of the success of my efforts in that direction. Everything mentioned in the book is advertised by reliable parties, so that the reader will at once know where to apply.

In short, I have endeavored from beginning to end to give the reader a complete guide, and in this particular it will be seen that the well filled advertising pages are not the least important to the work.

Hoping that I have not labored in vain,

I beg leave to remain,

THE AUTHOR.

Hammonton, N. J., May, 1893.

PREFACE TO SECOND EDITION.

The sale of the first edition has been simply wonderful; and I believe that much benefit has come out of it for the novice. There are a number of valuable changes in this edition, but practically the work is the same.

THE AUTHOR.

Natick, Mass, Jan. 1, 1896.

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CHAPTER I.

THE GROWTH OF PRACTICAL POULTRY FARMING — THE REQUIREMENTS — THE BEST WAY TO BEGIN — THE VALUE OF CROSSES — THE USE OF THE THOROUGHBRED — HOW TO HAVE HARDY AND PROSPEROUS STOCK.

Each year marks the wonderful growth of market poultry. The day has passed when the poultry farmer is to be sneered at. We have come to a time when it is necessary to raise fowls and eggs for table use, and the fancy poultry world has acknowledged the fact, inasmuch as she has given way to it. A poultry paper to-day is incomplete without a series of practical articles; a show is not finished without a premium for the practical cause; and the new fowl is of no use unless it can be proved that for *utility* it is recommended. Egg farms, broiler farms, and general poultry farms, are springing up all over the country, while the once exclusive fancy ranches are diminishing. To-day some of the largest fancy farms are resorting to market methods to get rid of their surplus eggs and fowls, and thus make ends meet. The farmer has at last found that poultry does pay, and he is making eggs and table birds an important branch of his business. The farm that ten years ago had one common flock of hens of all ages, to-day is ornamented with a comfortable house and well selected fowls. The one-grain diet has been dropped, and a regular bill-of-fare has been ordered, and the man who never had any eggs to sell in winter now brings them fresh to the door of the citizen. There are nine chances for success in market poultry where there is but one in the fancy. There is nothing gilt-edged about it, but there is a satisfaction of knowing that the demand is greater than the supply, and the man must be wide awake who wishes to cater to the markets. The work has grown to such an extent that epicures have become critics, and the best goods are eagerly sought after. It is just as important for the market man to send choice stock to the stalls as it is for the fancier to ship high-scoring birds abroad. Eggs must be clean and attractive looking; fowls must be plump and choice — none others need apply.

But there is one thing left, and that is recognition from the state experimental stations and the agricultural department at Washington. All the poultry papers and books, all the poultry editors and writers, in influence are but as a drop in the bucket to the value that these powerful agencies can give to the cause by prompt recognition. Why all these bulletins on insects and fertilizers, when the American hen is forgotten? Why all about the diseases of hogs, when the fowls of the country need medical skill? Why all about the market value of beef and pork, when the cry is for eggs and chicken flesh? It is a sad mistake — this snubbing the American hen. Importing eggs every year when the money could be placed in the pockets of our farmers! It is hoped that something will soon be done.

But not every man is fitted for poultry work. There is no question about it. Is a man with the tastes and abilities for a profession cut out to steer a plow? Is the man that is a born farmer in a position to take up physics? We all have our talents. Yet I believe there are more men possessed with the talents for poultry culture than any other occupation. What are the requirements?

Well, first, he must be wide awake. Drones never succeed with hens. Lazy people only meet with failure. Tired people can not make hens lay. The man must have his wits about him. He must study the egg problem as the broker watches the rise and fall in stocks. He must be ever on the alert for improvements.

Second. He must have pluck. "Pluck" seems a large word for the hen business, but it certainly is not too large for the risks to run. I say "risks," for I believe that every business has its risks, and the man who can meet reverses and hold on has pluck; without it he is sure to fail. A man with pluck is energetic; he is not afraid to work.

Third. He must be experienced. Of course, I do not expect he must know it all when he starts. If such would be the case there would be no poultry farms. But he must be well booked, and then he must put his learning to a practical test.

Fourth. He must have a fondness for the work; he must be in love with it. If a man takes an interest in what he is doing he will do it all the better; but if he enters a scheme for the money that is in it, ten chances to one he will fail.

Fifth. He must be financially equipped. You can not build houses on promissory notes. You can not buy land on credit. You can not get hens on time — and you can not feed them on wind, — and expect the first year or two to get out of debt. You should have enough cash to pay as you go, and until the farm begins to yield her fruits. Do not expect to embark on nothing. You can not in any other business; why should you expect it of poultry farming?

Recapitulation. — You must be up to the times. Never get the "blues." Be first a student, then a practical worker. You must love the work; you must have money. If you do not possess all these let your fingers off the industry.

As a rule the successful poultry farms are not made in a day. They are the outcome from small beginnings. By starting small there is a chance of gaining such experience which the books can not give. It is not reasonable to suppose that book knowledge alone will afford a man a chance to carry on successful poultry farming, any more than it could be expected in any other line of business.

Probably the best way to start an egg farm is to get one or two hundred eggs of the heavy layers, like the Minorcas, Leghorns, etc., and either hatch with hens (in most localities sitting hens can be purchased from farmers) or have some one put the eggs in his incubator. This would be giving a nice flock of pullets, which, if properly fed, would be brought into lay by fall. Each year the flocks could be enlarged, and a corresponding number of houses put up. Thus gradually, while the experience was being gained, the number of birds and houses would also increase. There is much to learn, and the only way to gain the knowledge is to thus " creep before you walk."

As many of my readers know, I favor the cross-bred bird in poultry farming. I do not want mongrels; but I have by experience been taught to value the bird born from first crosses. I do not like them so much for eggs as for the ideal points they give for table use, yet as *pullets* they will lay more eggs in winter than thoroughbred pullets will, but as *hens* the thoroughbreds will lead. By judicious crossing it is possible to put quick growth and fine bodies on the offspring. Besides, the unity of two pure bloods gives a hardier bird than is so often the case in strictly pure stock. I favor the cross-bred fowl on the same line that the dairyman does the grade in cattle, and the farmer the cross in hogs; but I have no use for cross-bred males.

I do believe that by uniting a heavy laying breed with one noted for its grand carcass and excellent table qualities, we can get a general purpose fowl that will do remarkable work in both eggs and meat. I have found that to be the case by crossing the Black Minorca on the Black Langshan, and by crossing the Houdan on the Brahmas and Cochins. I have likewise had early layers and big bodies in the cross of Plymouth Rock and Langshan.

I am repeatedly asked which of the heavy layers I have found the best for egg farming. My preference is the Minorca, as they are layers of large eggs, and almost as prolific as the Leghorns. On my place the relative qualities of the heavy layers have been as follows: Minorcas, Spanish, Anconas, White Leghorns, Andalusians, Brown Leghorns, and Hamburgs. I classify, first, according to the size of the egg; second, to the quantity of eggs laid; and, third, to the hardiness of the fowls. Of the list there is no doubt but that the records of the Hamburgs will be as good as any; but they are, as a breed, more delicate, and I believe that is one reason why they are not more generally kept.

I think outcrossing has much to do in keeping the stock healthy. It infuses new blood, which is most valuable to them, and which seems to give renewed strength to the offspring. I have tried the plan of improving a flock of Minorcas in this respect; or, I should have said, of making a *new* strain of Minorcas. It takes several years to do the work, but when once performed it gives excellent results. Take a flock of Black Langshan hens, and cross a Black Minorca cock on them. The next year pick out those pullets which show the best Minorca heads, and again cross a Minorca on them. Follow up the same plan the following year, each time using a new male bird, and in about three years of such work there will be a flock of fine bodies and grand constitutions, and the best poultry judges in the country could not tell that an outcross had ever been made. It may not be strictly "straight goods" for the fancy to follow, but as I am dealing with the market people, and as hardy and vigorous stock are of the first importance, the advice may be of some value. Other breeds can be dealt with in the same way. A flock of Pekin ducks can be greatly improved by outcrossing with Aylesbury. As inbreeding is one of the prime causes of ill-health, it can readily be seen that this outcrossing is a safeguard.

CHAPTER II.

The Success of Artificial Incubation — Running an Incubator and Brooder on the Farm — Building an Incubator Cellar — Colonizing the Chicks — R. G. White's Methods of Feeding Chicks.

The idea seems to be prevalent that the incubator and brooder were invented to take the place of the old hen. In other words, that this machinery would in time entirely supplant the hen for hatching purposes, and that they can do better work than the old-time "Biddy." Such an idea is false. I do not believe that the abilities of the hen — in her season — can be beaten. I believe there are some matters about her way of doing business that invention can not grasp. But by the invention of artificial methods, we are accomplishing something which seems entirely contrary to nature — the bringing out of chicks at a season of the year when there is not the least desire in the hen to become broody. Furthermore, we can now conduct the business on a wholesale plan, hatching thousands in a season, where heretofore we had to content ourselves with a few hundred. The success of these inventions has boomed the broiler market, and even with an endless string of incubators and brooders, we are unable to keep pace with the demand for frying chickens. It is a good idea to set both the incubators and hens. Start the incubators as soon in the fall as possible, and keep on until the hens become broody, when the machines can be stopped and the hens given the right of way. Some poultry raisers run their incubators the entire year, at the same time setting all the hens that wish to undertake the work.

The time is near at hand when every *enterprising* farmer will adopt the artificial methods in raising poultry. Above all others, the farmer is best adapted for the business; and why he should be so slow at taking hold of the work, I am puzzled to know. There is no fortune in sight for those who embark in the chicken vocation, but there is enough money in it to make it a most desirable farm crop. Buy a small incubator and brooder to start with, and after all the details are learned increase the capacity. In a few years quite a plant can thus be established, and an income added to the farm that will give a better margin than any other crop. I could point to a farm on which chickens and cows are kept. The product of both are sold. Milk, butter, eggs, and broilers go to market; but the eggs and broilers bring in two dollars to the milk and butter one. It requires less help to run the poultry branch than it does the dairy.

A cellar is valuable in which to run an incubator. It can be made any size. Dig out the earth, and wall up with stone or brick, the same as you would for a dwelling, allowing the wall to extend above the surface of the ground two or three feet. On top of this wall place your roof. The floor of the cellar should be cemented. Incubators run in cellars keep a more uniform temperature, and require less care.

I am not an especial friend to the large brooding system. I rather favor colonies of chicks. Having seen and experimented in both plans, I favor the latter. It gives a better chance for the youngsters to grow. I like to see these individual brooders scattered about as you would place the coops of the hen and her young. I don't want any fence. It is wonderful how soon each chick will know its own coop. In the colonization plan there is less danger of a spread of disease, and the chicks always look brighter and grow better than when confined to close quarters. Harry

Phillips, who has the largest brooding house in Hammonton, says if he had to do it over again he would have none other than chicks in colonies. In the large houses it costs as much for fuel for a single pen as for a full house. In the colony system your cost is what your product makes it.

The following interview appeared in FARM-POULTRY, Boston, Massachusetts, and was part of the broiler articles I wrote for that excellent paper:

I made a visit to the broiler farm of Richard G. White, on Fairview street, and when I left it I felt that I had a good share of practical knowledge for FARM-POULTRY readers. Mr. White is a plain, hard-working man. He is in the fruit business in summer, and the broiler business in winter, and he speaks very encouragingly of his occupation. He has no secrets, and does not flinch one bit in answering any and all queries that may be asked him. Last year he had a capacity for one thousand chicks, but this year he has increased to three thousand.

His system of brooding last year was the Packard bottom heat method; but this year he will use both the top and bottom heat, to fully satisfy himself which is best. Mr. White has a novel way of testing the heat in his brooders. He places a thermometer on a stand about two and a half inches from the floor, as he thinks this gives the best average temperature. He begins the heat at eighty degrees. This is the lowest temperature I have yet seen in starting young chicks, but the appearance of Mr. White's chicks would indicate that it is not a bit too low. There is more danger in getting the heat too high. One writer in particular uses one hundred degrees; but as I have never seen his chicks I am unable to say if they do well at such a heat. However, Mr. White's product gives living testimony to a lower temperature.

In the matter of feeding Mr. White is also different from the rest of the broiler men of Hammonton. He makes a regular johnny-cake, but leaves out the vinegar and soda which a number of writers suggest, and this cake he feeds the youngsters until they are one week old. It might also be stated that he puts Animal Meal in the cake instead of the usual prepared meat. He likes the meal for several reasons, but principally on account of its fineness — the chicks are bound to eat it. After the first week he drops the johnny-cake, and feeds a mash composed of equal parts of corn meal, bran, and middlings, with the usual amount of meat scraps. Now, as at this stage of the chick's growth bowel trouble is apt to show itself, he keeps a close watch, and regulates it with the middlings — lessening the quantity of middlings if the chicks become costive, and increasing the amount if they have looseness of the bowels. After trying this method for several years, he says he finds no trouble in keeping the chicks in the right condition. He feeds wheat and cracked corn only as a relish. Several times during the day, between meals, he throws several handfuls of the grain to them, thus getting them to exercise in scratching and running about.

Grit is constantly kept before them. He uses small sharp gravel, and likes it better than oyster shells for the purpose. When the young chicks are put in the brooder a pan of ground charcoal is placed before them. After several days, if it is noticed that they do not eat any of it, charcoal is put in their cake, and afterward in their mashes. "They must have charcoal," said Mr. White, "and I believe my success in raising chickens is principally due to the charcoal." But Mr. White does not stop here. He scatters oyster shell lime on the brooders every morning after he cleans up. They pick at it with a relish. And a pan of sifted coal ashes is put fresh before them every morning. It serves a double purpose: both as a dust bath, and a treat in various substances which they will pick out of the ashes.

"Had you good success last year in raising chickens?" I asked Mr. White.

"Very good," he replied. "My capacity was small, but out of fifteen hundred that I hatched, I lost only fifty, the remainder I marketed, as my books will show"—and Mr. White made an effort to get his books to verify his statement, but we assured him that was not necessary, as appearances at his place were enough to indicate prosperity.

"Why don't you raise your own eggs?" I asked.

"Well, I have two reasons. First, I do not have much faith in egg farms unless they can have a free range. I have not the ground to keep enough fowls on such a plan. So I do the next best thing by buying up my eggs from small flocks, and from birds that have my personal supervision. That is, they are mated and composed of such bloods as will give good broilers."

I tried to show him that the hens would be profitable in limited ranges if properly fed and taken care of. But Mr. White's opinion did not coincide with mine, and as he had such an excellent arrangement to get eggs, I did not use any further argument on that score.

The size of the "mother" (brooder) in Mr. White's pens is three feet square; the brooder floor is four feet six inches; the yard inside the pen is four feet six inches by five feet; and the outside yard is four feet six inches by sixteen feet. One of these pens he reserves for a hospital in which are put cripples, a dozen or more of which are apt to show themselves every season. The house of last year contained ten pens, in nine of which (one being counted out for the aforesaid hospital) Mr. White was compelled to crowd fifteen hundred chicks.

"Was not that a dangerous move?" I asked.

"Decidedly so," he replied, "but I could not help it. I had contracted for the eggs, had to take them, and, of course, was compelled to put them in the incubators. The eggs were remarkably fertile, and my incubators never worked better. Out came the chicks, and I had to care for them."

Considering the crowded condition of Mr. White's house last year, and the remarkable success he had in raising his chicks, I deem his method of feeding worthy of attention. He, however, will make one change this year, and that will be in the feed the first week. Instead of the johnny-cake he will make a cake from the recipe used by Mr. Howe, and which I have given in a former article in FARM-POULTRY. Only instead of the meat scraps he will use Animal Meal, as he likes that better for young chicks.

"What do you consider the proper number of chicks for your brooders, to avoid crowding?" I asked.

"I always aim," he said, "to have not over one hundred and fifty in the brooder the first week, although two hundred can be managed. When they run to three-quarters of a pound I thin down to one hundred. After that as a chance offers I take a few out, until only seventy-five are in by the time they reach the marketable size."

"Have you ever tried summer hatching?" I asked.

"About two years ago I gave it a trial, and met with very good success, never getting less than twenty-five cents a pound, and, in most cases, thirty cents. As there was not much cost in raising them, I felt highly encouraged in the results."

"Well, now, Mr. White," I concluded, "what is your candid opinion of the chicken business in all its branches, compared with farm work?"

"I have tried farming in all its branches, and have been fairly successful, but for capital invested, and the amount of real solid work, I can make more money out of the chicken business than I can out of any and all the other branches of farm life. I am not an enthusiast, but practical results tell: but I find broiler raising the most profitable of all the branches in the chicken business."

CHAPTER III.

Poultry as an Adjunct — A Butter and Egg Farm — Size of Hen Yards for Success — Building Hen Houses for Comfort as well as Profit — Feeding for Eggs — Mr. Hunter's Methods of Egg Farming.

Poultry pays best as an adjunct. During the past few years I have been studying the different branches more than ever, but I have yet to find one that can be depended upon as an exclusive affair. The farmer can make poultry his most successful crop, if he will only give the matter the proper care. But where are hens so much neglected as on the average farm? The hogs, cows, and all the crops grown have the proper attention given them, but when it comes to the fowls they seem of such little importance that they are seldom noticed. When you do find a farmer who takes care of his hens, you find one who will say they are profitable. Combine either egg raising or chicken growing with any other income, and the one helps the other.

One of the most successful farmers I know of combines butter making with egg raising. He keeps a dozen Jersey cows and three hundred early pullets. He keeps one breeding yard, and from that he each year hatches his pullets, getting them out in April. They are of the Single Comb Brown Leghorn breed. They begin laying in the fall, and they furnish eggs right through the winter and early spring, just at the time when eggs are high. The Jersey cows give him a good lot of rich milk, which he turns into a very good article of butter.

Both butter and eggs being staple articles. there is no trouble about finding a ready cash sale. I might add this man has a retail custom. Twice a week he goes out with his wagon to a near-by city and delivers to private custom.

He furnishes his patrons with the best of butter and strictly fresh eggs, and that is why he carries the best trade.

I know of another man who conducts the business on a somewhat different scale. He, too, keeps poultry and cows. But he uses his eggs for broilers and roasting fowls, and he sells the milk. He makes a good income. It is hard to say which of the two methods pays the best. In labor they are about equally divided. The one saves labor by marketing his eggs, and not turning them into broilers; while the other saves labor by selling his milk, and not turning it into butter.

There seems to be a general impression that unless a fowl has the run of a whole farm it will not thrive. It is not acreage that a fowl wants, so much as the quality of the soil upon which it is turned. A yard 50 x 100 feet, sown to grass, can not be entirely destroyed by a pen of eleven fowls; and this pasture will afford them as much if not more benefit than a farm of weeds would. I get more eggs from my fowls — and they are confined to yards — than my neighbors do who allow their poultry to go where they please. I more fully explain this later on in this chapter.

I am so often asked to give plans for a model poultry house. What they mean by a model house, I can not understand. It may have reference to architecture more than comfort. In my estimation a model house is one, regardless of outside appearance, perfect on the interior. I want the house warm in winter and cool in summer. I want it well ventilated. I want it kept perfectly clean. A scratching-shed must be added, as a "living room" and "work shop" during cold, windy, and wet weather — and every nest and roost must be movable.

I herewith give an article I wrote for the Germantown (Pa.) *Telegraph*, on the subject of eggs in winter, which gives my methods, and which, I think, will be of some value:

"Green food and meat are acknowledged to be the proper feed, along with the mashes and grain, for eggs in winter. To get eggs when the prices are high, is not such a great trick as some people would suppose; and the fact that eggs are scarce during the cold months, does not show that it is impossible for the hens to lay; but rather that their keepers are not so well booked in the science. If hens and pullets receive the proper food and attention, they will lay, even though the snow be a foot deep on the ground. This may sound like a big undertaking. but I can assure my readers that my hens are now in full lay, and that last winter they gave us eggs right along, and even through the spring and summer, up to the moulting season. I think I can lay some claims to the methods I have adopted. As I hold no secrets, I will give my plan: Such scraps as potato parings, turnip parings, cabbage leaves, and what refuse there is generally in the vegetable line, I cook each day, and add to the soft feed in the morning. The last thing I do at night is to take equal parts of bran, middlings, ground oats, and cornmeal, and scald them in buckets, leaving them to steam until morning, when they and the vegetables are thoroughly mixed, and fed to the fowls in a crumbly state. Twice a week I put a little condition powder in the mixture, to stimulate the egg organs. (I use Sheridan's Powder, as with me it has given the best results.) And every other morning I add a pint of beef scraps to a bucketful of the mixture. A pinch of salt is also daily added to a bucket of feed to give it the proper seasoning. At noon I bury wheat in litter in the scratching sheds, which at once puts the fowls to active work, and which they keep up, more or less, until supper time, when I give them a feed of oats. If the weather is very cold I give whole corn — not for eggs — but as a warmth to the body, as corn is slower in digestion. Fowls with full crops never freeze, or mind the cold so readily. A cabbage head always hangs up in the hen house, and this not only gives them good greens, but affords considerable exercise in their efforts to pick off pieces. All my fowls are in yards, about in a space of one hundred by fifty feet, where they are kept the entire year, excepting that on alternate days each yard is allowed the run of about two acres sown in rye. During the entire winter they are thus given green food, and when in spring the rye has grown high enough to be mowed down, I cut it off and plow up the land and sow wheat, and when that has become too tall I follow with oats. Then I begin over again with rye, and so on. Thus it will be readily seen that the fowls are always supplied with greens of some kind. Sharp grit and ground oyster shells are constantly before them, and I have the satisfaction of knowing that my fowls are continually in good health, and are profitable.

" So much for feed. But there are other conditions that must not be neglected, and which go far towards maintaining good health and profit. Each pen is provided with a scratching shed; here the birds can busy themselves during rainy weather, or when the snow is on the ground. They also seek this shelter during heavy wind storms, and to these sheds I give the credit of warding off much sickness. Exposure has caused more disease among fowls than anything else (unless it be filth), and I would never think of erecting a hen house without having a scratching shed adjoining it. (In this edition I give a photographic illustration of one of the houses and scratching-sheds combined, as used on my Hammonton, N. J., farm. I got the idea from I. K. Felch, Natick, Mass., who was the first writer on the subject I know of). My houses are also warm. They are built of matched boards, and lined with heavy lining paper. The roofs are shingled. I take great care in keeping the houses clean, never allowing the manure to accumulate; and as I have a platform erected below each row of roosts, the droppings are readily caught. After I have gathered the manure I scatter air-slaked lime over the platform. Every now and then I pour kerosene over the perches, and once a month I fumigate the interior by burning sulphur in each pen, and thus I keep down the stench so common in many poultry houses; and my fowls are comparatively free from lice. This is a great point in poultry keeping. A lousy hen can never be a profitable laying hen; and very often disease of some sort or other is doctored for, when in reality nothing more is wrong than the life being gradually sucked out of the fowls by lice. And fresh water in perfectly clean fountains must be given. I keep the fountains sweet by occasionally scalding them out with hot water to which is added a small lump of washing soda about the size of a hazelnut.

"So much for general care; now for the stock. I have mentioned feed first, because I deem it the most important. I followed with general care, because in my estimation it comes next. And the matter of stock is mentioned last, not that I consider it the least important, but from the fact that it matters very little what breeds of fowls you keep so long as you give them the proper feed and care. By that I do not mean that one breed will do as well as another, for such a claim would not be reliable. We have breeds that are built for egg production, and we have breeds for meat, just the same as we have a difference in the breeds of cows. But I do mean to say the best layers in the country will not respond to indifferent treatment. I knew a flock of Light Brahmas that laid more eggs in a season than a corresponding number of Brown Leghorns owned by another party. The reason was plain: the Brahma man knew how to make hens lay. Yet I would not advise anyone to buy Brahmas for an egg farm. Minorcas, Leghorns, Andalusians, Anconas, and Spanish are best adapted for that work, and if handled rightly produce large records. I have now special reference to egg farming, where the product is to be marketed. At present I have Black Minorcas and Brown and White Leghorns for eggs, and these I hatch out in April and May, from which hatches I select the finest pullets for laying in the fall. I never keep hens after they are two years old, but depend principally upon my pullets and two-year old hens for my eggs. I find there is more money in fattening and marketing the two-year old fowls than to continue them in the yards with their records annually decreasing. Thus I have outlined my methods, and give them for what they are worth. I do not by any means wish to imply that they are perfect; but that they are so far doing well with me, I can assure those who are interested."

In connection with my methods as given above, it might be profitable to give those of A. F. Hunter, in FARM-POULTRY. The following extracts are from that journal:

"Five mornings in the week we feed a mash made up of about a third cooked vegetables mashed fine, or cut clover cooked by being brought to a boiling heat in water, an equal amount of boiling hot water added, a heaping teaspoonful of salt to a bucketful; a heaping teaspoonful of Sheridan's Condition Powder two days, then powdered charcoal one; and into this is stirred mixed-meal until the mash is as stiff as a strong arm can make it.

"This mixed-meal with us consists of one part each corn meal, fine middlings, bran, ground oats, and Animal Meal, a scoop or dipper of each being dipped in turn into a bag and poured from the bag into the meal barrel, from which it is dipped into the mash. We consider the thorough mixing of these meals a considerable factor in making a good mash. When we have cut fresh bone in abundance we omit the Animal Meal from the mixture; ordinarily we have only about half-rations of cut bone to go round, so use, regularly, half the amount of Animal Meal to make up the deficiency.

"The foundation of the mash is the cooked vegetables, which may be refuse potatoes, beets, carrots, turnips, onions, (anything in the vegetable line),—and into the pot goes the table waste, potato parings, etc., and the potato, squash and apple parings from the kitchen. The potatoes or beets, etc., are washed before putting on to cook, and the mess when boiled is sweet and savory.

"This mash, our readers will notice, contains a great variety of food elements, and this *variety* is a quite important factor. A fowl needs a variety of food to supply her various physical needs, and gives her a surplus out of which to make eggs; and this 'variety' of foods we believe we can best attain in the manner described above. An additional advantage is that a tonic or stimulant can be added if desired. We sometimes substitute a teaspoonful of tincture of iron for the condiment, and sometimes add a handful of linseed meal or cottonseed meal; but the latter are somewhat fattening (as well as stimulating), and those who feed their fowls *well* must beware of too fattening foods.

"This morning mash is fed in troughs large enough so that *all* of the fifteen fowls in a pen can get about it at one time,—another important factor,—because if the trough is small some of the birds have to stand back and wait for second table, and when their chance does come there's nothing left for them. With a trough four feet long by six inches wide, there is plenty of room, and if a biddy is driven away from one place she runs around and goes to eating at another, and thus all get a share.

"Our fowls have exercise ground in summer in yards 125 x 12 feet, which gives them a grass-run (with growing grass always in the growing season), and they will take ample exercise in pleasant weather. To keep them out of doors the noon feed of whole barley (or buckwheat) and night feed (before sunset) of wheat, is scattered upon a graveled space immediately in front of the houses. Each family of fifteen has a pen within the house twelve feet square (or one hundred and forty-four square feet of floor-space), which gives about ten square feet per fowl. The floor is the earth, covered about six inches deep with screened gravel. On the gravel the grain is scattered in stormy weather in spring, summer, and early fall, when we want the birds to stay in-doors. When cold weather approaches, exercise must be stimulated, and we cover the pen-floors three or four inches deep with chopped meadow-hay, or chopped straw, into which the grain is scattered; and the biddies have to dig it out. Some poultrymen use dry leaves for pen-litter; chaff from a threshing mill would be most excellent—(nothing could be better); and we have found one or two cases where common cornstalks were used. With us straw or meadow-hay is most easily obtained, and we use that. *What* the scratching material is is of far less importance than that the scratching material is there.

"Whole wheat is *the best* grain-food for fowls; whole barley is the next best, and buckwheat next. We make barley or buckwheat the noon feed five days in the week, and wheat the night feed five or six days in the week. We do not make the mash on Sunday, because we want to reduce the work to its lowest terms on that day, doing no more than the regular feedings and waterings, and collecting the eggs.

"Monday we feed oats (or barley), wheat, whole corn.

"Tuesday we feed mash, barley (or buckwheat), wheat.

"Wednesday we feed mash, cut bone, wheat.

"Thursday we feed oats, barley, wheat (or corn).

"Friday we feed mash, barley, wheat.

"Saturday we feed mash, cut bone, wheat.

"Sunday we feed mash, barley (or buckwheat), wheat.

"Two feeds of cut bone each week, one or two of whole oats, and one or two of whole corn (according to the season), give variety to our ration, and to that is added whole cabbages hung in the pens in cold weather to tempt picking them to get green food; or turnips, or beets, or carrots are split in halves and placed in pens to be picked in pieces and eaten.

"Ground oyster shells are always accessible, and fresh water, replenished three times a day (warm in winter), —and the water-pans are carefully rinsed every day.

"One variation from this programme we purpose making this winter, and that is a slightly lighter feed of mash in the morning, making it a break-fast rather than a full meal, and then scatter barley or buckwheat in the scratching material about mid-forenoon (and the last feed mid-afternoon), to induce even more scratching exercise. To search and scratch for seeds, grains, insects, etc., is the fowl's normal method of feeding — and the nearer we approximate to nature's way the better; hence the greatest possible amount of exercise should be compelled."

CHAPTER IV.

How to Test Eggs — Poultry and Fruit — Broilers and Berries — How the Scheme Works in Hammonton — Specialties in Vegetables — A General Poultry Farm.

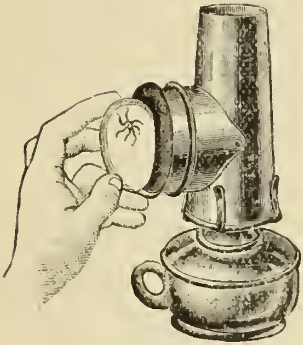

Fig. 1.

Testing eggs is an art. The science of it goes beyond the mere distinguishing of the fertile from the infertile. An expert can tell pretty well if the eggs will hatch at all, and which will produce strong chicks. Practically, he is able to "count the chickens before they are hatched."

Ordinarily, the writer tested his eggs on the seventh and fourteenth days, especially in the case of dark shells. White eggs can be tested on the fourth day, and even more easily than dark shelled ones on the seventh day.

It is always advisable to test the eggs, whether they be in the incubator or under the hen. By testing, room is made for the chicks when hatched, and foul odors in the incubator are prevented. Besides, the infertile eggs are very good for breaking in the chicken feed. We like the plan of breaking up these eggs and mixing with the morning mash for the laying stock. Raw eggs will not give bowel complaint as boiled eggs are apt to, and they furnish an additional amount of material for the manufacture of new eggs. An allowance of one raw egg to every two fowls is about the proportion in which they should be fed at a meal.

The illustrations we herewith give show the starting of the germ, or how it looks at the first test (see Fig. 1), how

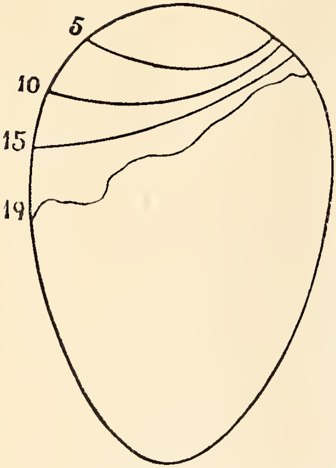

Fig. 2.

the air cells of eggs look during incubation ; Fig. 2, showing the appearance of the air-cells on the 5th, 10th, 15th and 19th days in a hen's egg ; and Fig. 3, the 1st, 7th, 13th, 20th, and 26th days of a duck's egg. These illustrations were kindly loaned us by the Prairie State Incubator Company, of Homer City, Pa. In addition we present an illustration, (Fig. 4) showing how experts generally test eggs without the use of a tester. The room being darkened, an ordinary hand lamp is used, and the eggs held up to the flame. The egg is held in the left hand, and the top shielded with the right.

If, upon the first test, nothing can be seen, the egg appearing perfectly clear, it is infertile, and must be taken out. If, on the other hand, it shows a regular spider shape, like that given in Fig. 1, it proves that there is a live germ in it, which, under proper conditions, will bring forth a live chick. As incubation progresses this

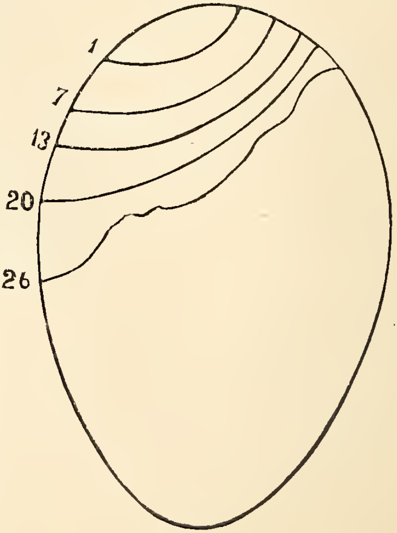

Fig. 3.

germ grows larger. If a germ dies, it can be seen by a distinct red line in the form of a circle, and about the size of a silver half dollar. Some will be but the size of a silver quarter, others will have a regular half-moon circle, and some merely a speck. All these, and the clear ones, must be removed.

Each day of incubation the eggs become darker, until the fourteenth day, when the chick can be seen to move. If any should die after the first test, they will be noticed to float when the eggs are turned, and no veins will be seen.

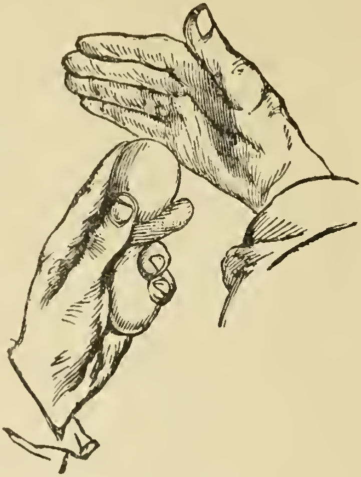

Fig. 4.

A. F. Cooper, in his instructions with the Prairie State incubator, says:

"To increase the size of air cells, open the ventilators, and run with little or no water. To retard development, give full pan surface of water, and close ventilators, but not enough to interfere with ventilation. The egg tester will show the size of the air cell at any time."

The importance of testing eggs, even under hens, is well explained by James Rankin, in his book, "Sixteen Years in Artificial Poultry Raising," as follows:

"I once knew a man to set forty or fifty hens early in February, with a view to grow a lot of broilers for early market. When the hens came off, he found that there were but two or three fertile eggs under each hen. Now had he examined his eggs at the end of four or five days with a tester, he might have put the few fertile eggs under several hens, and supplied the remainder with good eggs. He would have lost but little except in the first cost of his eggs. As it was, the best of the season had passed, and he could not hope to receive large profits from his chicks.

"I was called by a friend to see his incubator. He told me that he had put five hundred eggs in it, and had hatched only one chick, and that died; and he wished me to ascertain the cause if I could. I found the eggs in the machine just as he had left them. I broke several hundred of them without finding the least sign of fertility in them. The yolk was intact, and the white apparently as clear as when first laid. I told him that he had done very well, as he had hatched one hundred per cent of all the fertile eggs. At the same time I told him that any man who would deliberately run a machine three weeks on five hundred eggs without taking any pains to ascertain their quality, had better change his occupation, for he would never succeed in the poultry business."

Mr. Rankin also says that after the twelfth day, the growth and development being rapid, the chick will bear far greater changes of heat and cold than at the earlier stages of incubation. At one time, he says, he carelessly allowed the temperature to reach one hundred and fourteen degrees for a short time on the eighteenth day of a hatch. There were four hundred fertile eggs in the machine. The next day both the inside and outside doors of the machine were left open. The glasses on the eggs registered sixty-eight degrees, and yet three hundred and seventy-one chicks were hatched from those eggs on the twenty-first day, or over ninety-two per cent. But anything like that variation during the first ten days would be fatal to every egg.

The eyes, beak, legs and feet of the embryo are gradually developed, but it is not until the nineteenth day that the yolk is completely absorbed and the chick ready to come out. He begins by making a faint peeping inside the shell;

then breaks it and works his way entirely around the shell, breaking it as he goes, and finally bursts it open and makes his appearance.

Charles A. Cyphers, in his book, "Incubation and Its Natural Laws," says that infertile eggs should be tested out about the tenth day. This is the longest time yet set by any expert — the seventh day always being the longest time allowed by other authorities.

E. & C. Von Culin, in their work on the "Art of Incubation and Brooding," say that all eggs should be tested on the fifth or sixth day, and at this test all clear or infertile eggs should be removed.

In the chart gotten out by J. L. Campbell, West Elizabeth, Pa., eggs are shown in the different stages of incubation. Twenty-four hours after incubation the fertile egg will show a faint reddish spot, no blood vessels being visible. Illustrations are also given in this chart showing right and wrong positions for chicks to grow in the shell. No matter what incubator you are running, this chart will prove invaluable, and the writer does not hesitate to recommend it to FARM-POULTRY readers.

Poultry and fruit make a good combination, and those who follow it generally keep the poultry for eggs only, and plant the trees in among the fowls. That it is profitable to both fowls and trees, to have this combination, I will make a few selections:

The *Poultry Guide* says: "We have sixteen apple trees, now seven years old, standing in and around our poultry yards. Some of these, standing directly in the run of the fowls, have had as many apples as any five of the trees on the outside. This is conclusive evidence that the one is beneficial to the other. * * Some have been literally hanging with nice apples, and so heavily laden that we were compelled to keep the limbs well propped to keep them from breaking down. * * We at the same time get the needed shade while we get a bountiful supply of delicious fruit."

The *Mirror and Farmer* says: "There is no reason why fruit growers should not make poultry a specialty in winter. * * * The broiler raisers of New Jersey pay no attention to poultry from April to October, but after the fruit is harvested they are as busy as bees, hatching chicks with incubators. * * * The farms are small, ranging from five to ten acres, yet the fruit growers make larger profits than are secured on some farms of a hundred or more acres. They raise fruit in the summer and poultry in the winter."

The *American Cultivator* says: "If the hen house is built in the orchard the fowls will do good work in keeping down the insect pests that destroy every year so much of our finest fruit. They do this both by scratching about the trees and by eating the imperfect fruit that falls, thus destroying the grub before it is time to burrow in the ground."

The *Poultryman* says: "Your birds need shade as well as sun. Set out a few plum trees in the yard, and the hens will destroy the grub and enrich the soil, so that by little trouble and expense you can raise some of the most delicious fruit."

The *Fanciers' Journal* says: "Poultry raising and fruit culture go hand in hand, and may be combined on the same ground. An orchard is much benefited by allowing fowls free range, as the crop of harmful insects is kept down."

George J. Nissly, proprietor of the Michigan Poultry Farm, Saline, Michigan, says: "We combine fruit growing with our poultry business, and find that, if properly managed, no two branches of business go more profitably and nicely together than these. Each helps the other, and we virtually get two crops from the same ground. In our yards we plant plum, pear, and quince trees; while on our grounds used for growing young stock we also grow large quantities of raspberries, blackberries, grapes, and strawberries. These fruit grounds make a splendid place for the chicks, it only being necessary to exclude them from the strawberry grounds a short time during the ripening season."

In the town of Hammonton, N. J., nearly every broiler raiser is a fruit grower. Strawberries, raspberries, and blackberries are raised in large quantities during the summer, and broilers in the winter. It is a profitable combination with the Hammontonians, and it would be hard to get them to depart from their plan.

Some do not make a specialty of fruit, but engage in vegetable growing to some extent. Specialties are often used, such as the growing of onions, lima beans, and sweet potatoes. All these notions may be profitable to the man who wishes to make up a combination he may like best.

The question has been asked me, What is a general poultry farm? Answers to that question may differ. To my idea the best general poultry farm would be one that would combine egg and fruit growing with the raising of broilers, roasters, and ducklings. Keep the April and May pullets for eggs, grow the fruits in the poultry runs, raise the broilers when the prices of eggs decline, sell off annually all the two year old fowls for roasters, and hatch the ducklings during their season. By a little management in this plan a steady income can be secured, and there will be a big profit. I merely give these combination hints to show what can be done: the reader must make his own decisions, and in his energies lie all the means of success.

CHAPTER V.

The Atlantic Duck Farm — Duck Culture for Profit — Size of Houses — How the Breeding Ducks are Fed — How the Ducklings are Fed — How to Dress Ducklings for Market — Other Useful Points.

When, in 1858, the late W. W. Hallock inaugurated duck culture at Speonk, Long Island, N. Y., beginning on a small scale, little did he expect that from his small beginning such large proportions would be assumed as are now apparent on the present Atlantic Farm. The venture was at first made as an experiment, and hens employed to do the hatching and brooding, but the plant grew steadily. Later on, Mr. Hallock's son-in-law, Mr. S. B. Wilcox, was taken into partnership, and Mr. A. J. Hallock (the present proprietor) was installed in the position of "feeder." After the son-in-law withdrew from the firm to start a farm of his own, the son (Mr. A. J. Hallock) was taken in, and the firm name changed to W. W. Hallock & Son. Under this management the business prospered, and the capacity increased each year. After the death of the senior member of the firm, the business passed into the hands of the present owner, who is doing his very best to make it second to no other duck farm in the United States. There is a world of enterprise in Mr. Hallock, who, although a young man yet, possesses a wonderful business ability, which, combined with the thorough knowledge of the business, fits him admirably for the work. One thousand or more breeding ducks are kept, and these are the cream selected from between twenty and twenty-five thousand ducklings hatched. Ducks weighing twelve pounds each are common, while some reach more than that weight.

Each pen is supplied with large ponds of water, and it is a beautiful sight to watch the birds darting in the water, flapping their wings, and perform all sorts of interesting antics. Notwithstanding all former claims that ducks do as well without bathing water as with it, the fact was clearly demonstrated on this visit, that bathing water stimulates exercise, and keeps them in a healthier and more desirable condition. Some of the farms on the Island do not adopt the water plan; but a careful comparison showed that those birds kept in the natural state have a great advantage, to say nothing about the labor saved in supplying them with water to drink. Mr. Hallock also informed your correspondent that by having bathing water supplied each pen, a less number of drakes are necessary in a flock. From six to nine ducks are given a drake in the beginning of the season, and as the season draws to a close as many as twelve are allowed. Another point in the argument is that ducks supplied with bathing water save the process of washing before dressing for market. As the feathers must be perfectly clean before they can be marketed, it is necessary to carefully wash all land ducks before they are dressed, which consumes considerable time, and which can not be performed so thoroughly as when the birds are given an opportunity of doing the work themselves. Aside from these advantages, however, Mr. Hallock thinks there is no difference regarding weights — that ducks confined to land can be made as heavy as those given water, and *vice versa.*

The houses for the breeding-pens measure 13 x 13 feet, and the runs 26 x 125 feet, of which 26 x 36 feet is water. In each of these pens about thirty ducks are kept. The floors of the houses are earth, bedded with salt hay. An elevated railway conveys the feed to the birds, saving much labor.

The incubator cellar is certainly the most systematic arrangement I ever saw. It is built of brick, and the earth banked up on the sides and ends. It measures 24 x 50 feet, and will hold thirty-three large sized machines. The floor is cemented. In order to make the building still more serviceable for incubating, the walls are double, with a four-inch space between them. The ventilation of the building is very good, and consists of flues on each end of the room.

Three large brooding houses are employed, each with a capacity of two thousand. Top heat is furnished by hot water pipes, the Spence heaters being used.

The breeding ducks are fed a mixture made up as follows: Four pails cornmeal, two pails bran, one pail middlings, one pail oats, and one pail wheat. These are mixed with two bushels chopped grass or greens — chopped clover hay being substituted when green stuff is scarce. The grass used is what is known as eel or creek grass, taken from the bottoms of the creeks and brought ashore on floats. It is chopped up fine when fed. One hundred to one hundred and forty eggs a year Mr. Hallock claims as an average in his flocks, and these show remarkable fertility, which speaks well for his system of feeding.

For ducklings the food for first week is as follows: Equal parts cornmeal, middlings, and crackers or stale bread, and green food. A small handful of sand is mixed with every quart of the food. Bread soaked with milk is sometimes given for a change. No milk is given to drink, as they get it in their feathers, which makes them sticky and easily pulled out. The second week the following composition is given: Four parts cornmeal, two parts bran, two parts middlings, one part beef scraps, and about the same quantity of sand as is given the first week. The above is mixed with about one-third of the quantity of green stuff. At about six weeks of age the ducklings are put into the fattening pens and fed two-thirds meal, and the remaining one-third of bran, middlings, and greens. About one-seventh or one-eighth the amount of meat scraps. The ducklings are marketed when about five pounds in weight. Last year forty-five cents per pound was realized in April, and as the season advanced the price decreased, until in August it reached fifteen cents. The loss is variously estimated at from five to ten per cent.

The picking is done mostly by women. As soon as the birds are stabbed they are put in a convenient place and scalded, the water for that purpose being just brought to a boil. The plan of operation is so minutely described by G. A. McFetridge, in his book on poultry, that I will make a few extracts from that, by his permission.

"Two posts are planted in the ground about ten feet apart. The posts are either mortised or a notch sawed in them near the top, five feet from the ground. A rail is then spiked in these notches, and strings fastened to the rail, with loops to hold the feet of the ducks. As many pegs are driven in the ground underneath the rail to correspond with the number of strings. To these are fastened a short piece of wire, the top of which is bent in the shape of a hook, which is fastened into the duck's nose. This prevents the duck from swinging its head around and soiling its feathers with blood.

"In dressing, the breast feathers are removed as soon as possible. The feathers on the head, a few on the neck, the flights in the wings, and the tail feathers are left on. Duck feathers bring about thirty cents per pound, which about pays for the picking."

In addition to the one thousand breeding ducks that Mr. Hallock keeps, he also has about a thousand laying hens. Outside of the duck season he utilizes the eggs in the incubators for broilers, and when duck eggs claim the machines the eggs are marketed. As the duck season only opens in February, and closes about the latter part of September, the broilers can be gotten out and marketed at the very season when prices are at their best. Mr. Hallock's combination is certainly a good one. Eggs for hatching are also sold from this farm, and Mr. Hallock informed me that the past season he disposed of twenty thousand eggs from his advertisement in FARM-POULTRY.

Aside from the above farm, there are a score or more of prominent ranches in this immediate section of the island. Mr. Hallock's is the largest, and that of E. O. Wilcox probably comes next. Mr. Wilcox's house for his breeders is two stories high. On the first floors are pens 13 x 17 feet. On the second floor are kept hens for eggs.

On the farm of S. B. Wilcox, at Centre Moriches, are kept about six hundred breeders, and thirty incubators are run during the season. A noticeable feature in the picker house on this farm is a running stream of ice cold water, which is valuable in plumping the birds when dressed.

The Pekin duck is exclusively kept on the Island. In the early days of the business the Muscovy was the only available breed; but since the Pekin has been introduced into this country the Muscovy has been crowded out. A man with four hundred Pekins makes a good living; and several instances were shown where even such a small flock as one hundred ducks gave a handsome return. Of course, there is considerable work attached to the business, but when properly managed the Long Islanders claim there is more profit in duck culture than broiler raising.

Of incubators the most prominent are the Prairie State, Monarch, Thermostatic, and Pineland. For brooding, the Spence, Gurney, and Bramhall heaters are the most used. The partitions in the brooding houses are less expensive than in broiler houses, as a one-foot board uprighted is sufficient to separate each pen.

The following pointers have been gleaned from interviews, correspondence and writings of such men as Rankin, Hallock, McFetridge, Campbell, Irish, and others, together with our own experience in duck culture on a small scale, covering a period of nearly ten years. We combine them here in one article, believing that they will be appreciated and of value.

The *American Cultivator* says the duck has fewer objections than any fowls — it is no scratcher, is not given to flying, is healthy, hardy, has a fine sized carcass — a strictly home bird. They are easily raised after the first few weeks, during which time they have to be kept from wet until their feathers grow and shed the water, after which they are liable to fewer ailments than chickens.

An experiment carried on some years ago in France, to determine the relative value of hens and ducks as egg producers, resulted greatly in favor of the ducks. Three birds of each sort were selected for the trial, and between the first day of January and the last day of August the three hens laid two hundred and fifty-seven eggs, and the three ducks four hundred and two eggs. Moreover, in the autumn of the previous year the ducks had produced two hundred and fifteen eggs after the hens had ceased laying altogether.

The *Rural New-Yorker* says, for the table, every one is willing to admit the duck's excellence, though the want of cleanliness in its habits meets with everybody's reprobation. As a feeder it has few equals, while its feathers in the market stand high above those of the hen or turkey, and only second to those of its giant companion, the goose.

At Hammonton, N. J., an experiment was tried with ducks and chicks by P. H. Jacobs and others, to determine the relative growth of each in a given time. This is the result:

Compared with chicks, the growth forced on high feeding, with a lot of ten ducklings and chicks for experiment, with the same amount of food for producing one pound of flesh (usually a cost of five cents for each pound of carcass), we present the following:

	Duckling.		Chick.	
	Pound.	Oz.	Pound.	Oz.
1 week old	0	4	0	2
2 weeks old	0	9	0	4
3 weeks old	1	0	0	6 1-4
4 weeks old	1	9	0	10
5 weeks old	2	2	0	14
6 weeks old	2	11	1	2 1-2
7 weeks old	3	5	1	7 1-2
8 weeks old	4	0	1	12
9 weeks old	4	8	2	0

As they approached maturity (after the eighth week) the ratio of gain began to become proportionately less, while some were heavier than others. The ducks were kept in a small coop, and fed to demonstrate the highest point they could be made to attain, the purebred Pekins being used for the experiment.

A duck generally lays as many eggs in a year as a hen, but she performs the work quickly, and rests the remainder of the season. The hen extends her laying throughout the entire year.

General Management. — Earth is the best floor for a duck house — and this should be heavily bedded with soft hay. In Hammonton, and on Long Island, they use salt hay, as it is much softer than the ordinary article.

Five drakes and twenty-five ducks can be run together with a good chance for fertile eggs.

Rankin says the time for marketing young ducks depends altogether upon the breed. A Pekin will mature at nine or ten weeks as much as a Rouen will at twelve. Ducklings should be partly feathered out before marketed — but do not allow the second crop of feathers to start, as they will be full of pin feathers, and somewhat off condition — indeed, no heavier than they would have been if killed two weeks before.

Ducks are very peculiar about laying. They will often lay an egg, and consider several days before they produce another; but when once fairly at it, will produce an egg almost every day. The first eggs are rarely fertile. Ducks make very good incubators, but remarkably poor mothers, and contrive to get rid of a large share of their progeny unless confined and closely watched. They are good for breeding purposes till they are six or eight years old.

Rankin says: "The best food we have ever found for young ducklings, is one part hard boiled egg (we use infertile ones), and three parts stale bread crumbs, the first three or four days; after that equal parts of wheat bran, corn-meal, boiled potatoes, with a little beef scraps thrown in." The Long Island breeders add about a pint of coarse sand to the mash, for grit purposes.

A duck raiser giving his experience in the *Rural New-Yorker*, says ducks are easily hatched, and if properly managed are easily raised — much more so than chickens or turkeys. Probably the worst thing for ducklings is the first thing they usually receive, and that is, unlimited range, and water to swim in. The little things are, in a measure, nude, and should be kept in pens with dry soil floors or stone pavement that can be washed down daily. No kind of poultry will succeed on bare boards. All the water they need is best furnished by burying an old pot in the ground and laying a round piece of board on top of the water, with room for the ducks to stick their heads in and fish out the corn that is put in the water. This amuses them, and does no harm, while if allowed to go to ponds or streams, they are very liable to fall a prey to vermin in some shape, or to get their bodies wet and chilled from remaining too long in the water.

Ducks are enormous eaters. They feed not only incessantly all day, but if it is moonlight they will up and at it again every hour or two before morning. We know of no statistics to show how many pounds of corn it requires to make a pound of duck, but we do know that ducks are rapid growers, and if penned and judiciously fed enough to make the most rapid growth, will return a handsome profit for the food consumed.

To be bred successfully, says an English authority, ducks must have water which they can swim about in, and also have a reasonable amount of liberty. Those who live near running streams, or have a lake or pond in close proximity to them, have the matter settled favorably, though perhaps a little more may require to be done with a stream if it be but a shallow one.

Mr. Rankin, however, says that contrary to the general acceptation of the thing, it is not necessary for ducks, either old or young, to have access to a pond or brook, as simply giving them all the water they need to drink is all-sufficient. Indeed, they thrive better and grow quicker confined in yards with just enough water to drink. Shade is one of the essentials to duck growing in warm weather, also plenty of green food and vegetables. Ducks are gross feeders, but not particular as to quality.

Referring to general management, Mr. Rankin, in the *Poultry Keeper*, says: "We keep them in yards, with wire netting two feet high. Some of them dress over ten pounds per pair, the average being about nine pounds per pair. It is necessary to have water dishes so constructed that they can drink freely without getting wet themselves. We use galvanized iron tanks, about the size of a six-inch pipe, tight at one end and open at the other. Small holes are bored through this tank about a quarter of an inch from the top. It is then filled, or partly filled, with water, according to number and size of ducklings, and inverted into a tin saucer half an inch deep and about an inch larger in diameter than the tank, leaving a half-inch space for the ducklings to drink from between that and the tank; the water will ooze out of the little holes just as fast as they drink it, and no faster.

"Ducklings should be fed about the same as chicks for the first few days, giving them milk, if to be had, by mixing their food with it. Care should be taken the first few days to keep the young ducklings warm and dry. For the first week they will suffer more from cold and wet than chicks; after that time they will endure more of either than chicks. Cornmeal, exclusively, is too concentrated, and will cripple them in their legs and feet. It should be mixed with bran, boiled potatoes, etc. It is a pleasing and comical sight to see three or four hundred young ducklings when first out. They are much more interesting than chicks, hardier, and if well cared for the mortality is much less."

Campbell says ducks that are kept for breeding purposes must have a pond of water of some kind to swim in, else the eggs will be largely infertile, and there is usually quite a large percentage of addled eggs in them, imperfect germs, etc. This does not agree with Mr. Rankin's experience, who generally has a very large percentage of fertile eggs, and confines his breeders on land altogether. On Long Island some of the duckers use water for their breeding birds, and others do not; but Mr. Hallock, who uses water, told the writer that he did not believe it made much difference either way.

HATCHING.— Duck eggs require turning, and the same general handling as hens' eggs, during the period of incubation, says Mr. Rankin, and the same amount of heat, with a little more moisture after they begin to pip.

Cooper says duck eggs are not more difficult to hatch than hen eggs, and require about the same general treatment. The only point to bear in mind is that they require more air because they are larger, and are more difficult to dry down. The air cell will have to be larger than in hen eggs, so as to give the duck room to turn its somewhat large head and bill. The operator will have difficulty in a damp location in drying the egg sufficiently unless care is taken. Temperature should be 103 degrees, with a tendency below rather than above. Cool a little more than for a hen egg.

Campbell says duck eggs and hen eggs can be hatched together; but will hatch best if by themselves. The shells are very tough, and many of the young ducks will have to be helped out; but when they are out they will soon be as lively as crickets. Great care must be used to give the help at the proper time, as if done too soon the ducks will die.

"Ducks are unlike chicks in that respect," continues Mr. Campbell; "a chick that cannot get out alone is seldom worth helping out; but a duck that is helped out is usually as good as the one that can get out himself.

"Ducklings are like chicks in that they require no food for twenty-four hours after hatching out. They should first of all be given a few drops of water, using care not to let them get wet. They should never, under any circumstances, be allowed water to swim in until they begin to feather; then water will do them no harm; but they must have it before them at all times to drink and wash their bills.

"The same food that is good to raise chicks on will raise ducks. It must be quite soft at first, and a little water must be placed so they can get a dip with each mouthful. A young duck cannot swallow unless they have water with each bite. A duck does not swallow its food like any other creature I know of; it seems to get the food down by a number of spasmodic jerks. There does not seem to be any action of the muscles of the throat in swallowing, and they choke very easily unless the food is soft, and they have water.

"In hatching duck eggs they require just the same heat as a hen's egg. They start more slowly than hens' eggs, and cannot be tested with any certainty until the fourth or fifth days; then if perfectly clean, the germs will show quite plainly.

"They will generally chip the shell thirty-six to forty-eight hours before they get ready to come out, and should be turned with opening up, and left to lie still until they get ready to come out. It is well to examine and see if they have broken through the lining of the shell, as often it is so tough that they cannot break it even after the shell is broken through, and would smother for want of air. Open a very small hole to give them air, and that is all that should be done until the duckling is trying to get out. Then if it is turning round and round and not able to break the shell as it goes, help it by taking off the top shell. There is no danger of bleeding after they have begun to turn around, but until they do they will bleed; and although a little bleeding will not kill, it weakens them more or less. After they are out let them alone in the incubator until they are quite dry, then remove to a brooder that is one hundred degrees, and let them remain for twenty-four hours. After they have been fed once or twice they require about the same heat as young chicks. Run the brooder down to ninety degrees by the time they are a week old. After the feathers appear on the breast all they need is a dry place to gather in at night. They do not need artificial heat unless it is cold weather; then it is best to have it."

The idea somehow or other got adrift some years ago that duck eggs require more moisture than hens' eggs, in the main on account of being a water fowl. Mr. Rankin's attention being called to this, he replied:

"It is a mistaken idea that duck eggs require more moisture than hens' eggs. They require the same heat and the same amount of moisture, and precisely the same treatment in every respect. They usually pip forty-eight hours before they get ready to come out, and in the meantime are absorbing the yolk. Too much moisture in your machine is disastrous, as your duckling will pip and show his bill one-quarter inch out of the hole he has made from sheer pressure from the inside. He cannot get his bill back because the shell is closely packed with the bird, and he cannot work his bill either way to break away the shell, so that he is sure to die without help. Duck eggs should be evaporated, like hens' eggs, the first week of the hatch, as the embryo duck will enlarge so much the last week of incubation that the shell will be densely packed, and that usually means dead ducks. You cannot get too much moisture the last part of the hatch, but during the first part the eggs should be slightly evaporated. The ducklings with us begin to pip the twenty-fifth day; on the twenty-seventh they begin to come out; and in six hours they are usually out — a squirming mass. But whenever we see one with his bill through we always break the shell away on each side, to give him a chance to get out."

A few years ago W. Irish, a duck raiser, wrote quite a lengthy article for the New York *Tribune*, which contains much of value. We quote only the part referring to hatching:

"There are only a few kinds of incubators suitable for duck eggs. The shell of the duck egg is so porous that any incubator with a current of air passing through it is certain to use up the moisture within the egg, so essential at the latter part of the hatch. While it is necessary to have a little air, too much is worse than none. An incubator that maintains an even degree of heat, and has arrangements for moisture at hatching, is the only kind to rely on. After the incubator has run a few days and maintains an even degree of heat of one hundred degrees at the bottom of the egg tray, I put in the eggs at sundown, as it takes all night to warm them up. The next day I keep watch of its working, not forgetting that one hundred degrees at the bottom of the tray is equal to one hundred and two degrees at the top of the eggs. I test the eggs on the fifth day, and remove all clear ones, and also those whose germs have started and ceased to grow. It is well to make another test on the eleventh day, and remove all eggs that have become addled. On the sixth day you can see the heart beat, and the spreading of the veins through the egg. You will find in some a clot of blood and a circular vein nearly the size of the egg have been formed. These are of no account, and should be removed.

"A correct thermometer is of the utmost importance. No matter how good the incubator, if the thermometer is poor you will not be successful. Be sure that the bulb rests on a fertile egg, or you will destroy a hatch. The difference between the air in the egg chamber and the register of an egg containing a live duck is, at the last stage, as much as five degrees. An egg containing a dead duck is from three to five degrees colder than one containing a duck almost ready to break the shell.

"I think the true way in hatching chicks is to keep your incubator closed, as a chick that cannot liberate himself is of no account. But a duckling pips twenty-four to forty-eight hours before it is ready to come out, and you are obliged to open the incubator about every eight hours to turn up the pips, as the ducklings are apt to smother or drown in the slime of the egg.

"In an incubator full of eggs with live germs, you will find at the latter stage it is impossible to keep down the animal heat. Do not open the ventilators or doors to cool down the eggs, for you will then lose the moisture and make the shell brittle, and the inside lining of the egg will become tough. While spraying the eggs is injurious, my experience, and that of Mr. Rankin and others, shows that it comes nearest to the correct plan, as a superfluous heat is sure to destroy the hatch. Open one door at a time, use a fine spray, and close the door immediately. In this way no chill will strike the eggs. A sudden change of a few degrees is enough to kill them.

"After a duckling begins pipping it usually rests and the temperature begins to lower, but I think it should be kept up. Trying to help a duckling after pipping is very injurious, unless carefully done at the right time. Removing the lining and shell before they are ready to come out injures the blood vessels, causing the duckling to bleed and to weaken. If they pip at the small end of the egg, or in the centre, they need a little help, say about twelve hours after; but should have only a little help at a time, and should be placed at once in the egg chamber. If they are very large or deformed, they will often break the shell partly around, and die without any apparent reason. In trying to help them, too often you injure the hatch by letting too much air in the egg chamber. I find those that hatch behind time are of little value, hardly worth bothering with, and I place them under hens to bring out.

"If you have an incubator with an air chamber below, drop the ducklings below when dried off; but it is a mistake to take away chicks or ducklings until the hatch is completed. Mr. Rankin says that for every fifteen chicks or ducklings that you remove you lose one degree of heat in the egg chamber. You will find that the water in the moisture pans or tank is not as warm as the temperature of the egg, which shows the importance of placing the thermometer on a live egg. After the hatch is complete, open the ventilators, put down the outside doors, and let the ducklings remain without food until the next day, as nature provides all food required in the yolk."

DISEASES.— For sore eyes, Mr. Rankin advises washing out the sand and dust, and then bathing with diluted carbolic acid.

Ducklings when they begin to feather are often subject to giddy spells, tumble about, are unable to stand, and often die from the effect. It is said that if wood charcoal be put in their food it will at once correct the trouble.

The supply of drinking water should never be allowed to run out. Depriving the ducklings of water for an hour on a hot day, and then filling up their vessels with cold water, will generally result in killing the weakest ones of the lot, while others will stagger around like drunken men.

Damp quarters at night will produce leg weakness as quickly as anything can. Neither old nor young can stand dampness.

When grown ducks are very fat they are subject to vertigo and apoplexy, which ends in sudden death.

Large gray head lice on ducklings quickly kill them.

The drinking vessels must be deep enough so that the ducklings can cover their heads as soon as they are put on the ground. If not, a great many will be lost. One would suppose that they were paralyzed, as they lose control of their legs, and fall over. The whole trouble is that their drinking pans not being deep enough, the nostrils, stopped up with sand, cannot be washed, consequently the ducklings cannot breathe. They practically suffocate, and the weakness in the legs is the last stage. By that time they are incurable.

On this subject Campbell says the best thing to keep water in is a pan about two inches deep, filled so that the ducklings can cover the bill, and snort as they will do whenever anything gets in the nostrils.

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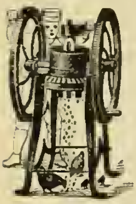

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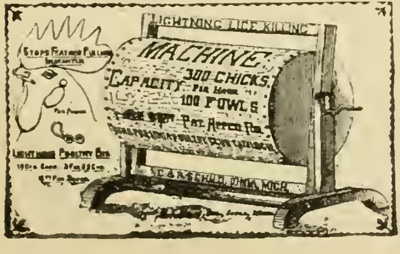

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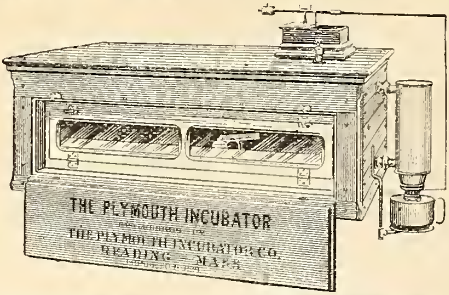
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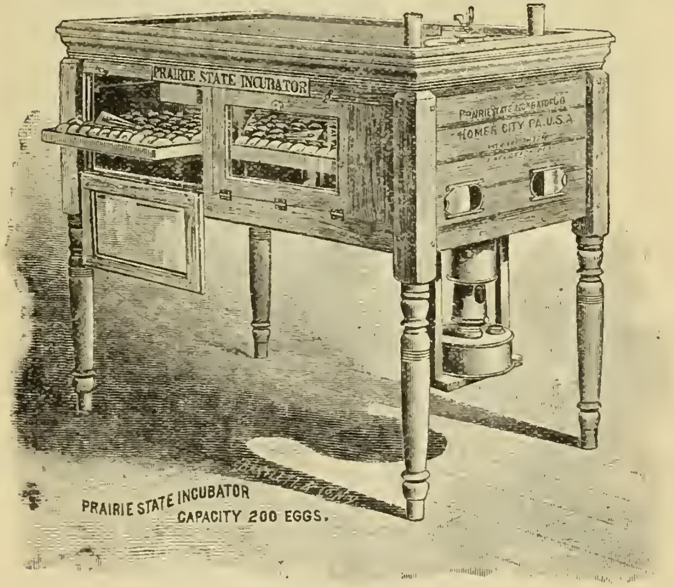

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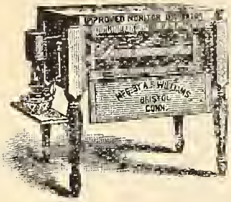

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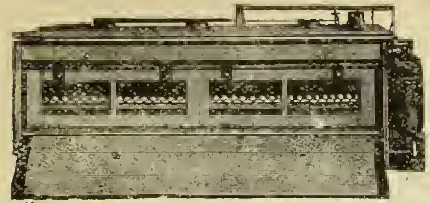

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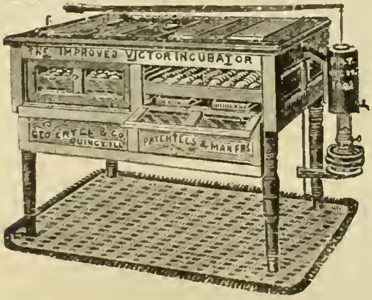

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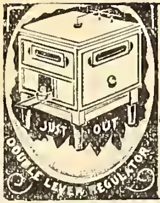

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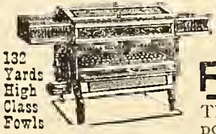
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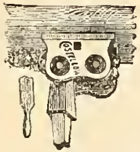

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